Experiment No.: 04

Name of the Experiment: Generate a Pulse Waveform and Use the Pulse Waveform as Gate Pulse in Thyristor of a Controlled Half-Wave Controlled Rectifier Circuit & Full-Wave Controlled Rectifier Circuit

Required Software:

- MATLAB
- Simulink

Objectives:

- To generate pulse wave from the source and use it as a gate pulse in thyristor
- To Implement power electronics circuitry in Simulink
- To verify the output of full-wave and half-wave rectifier circuit

Half-Wave Controlled Rectifier Circuit:

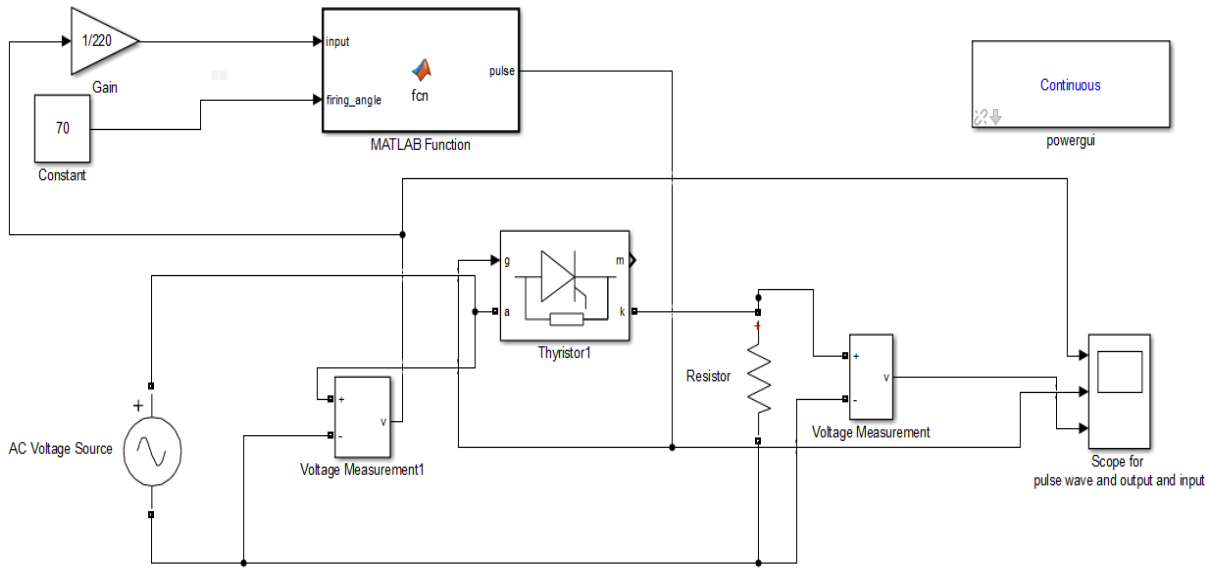

Figure 4.1.: Half-Wave Controlled Rectifier Circuit Using Simulink

Output Waveform:

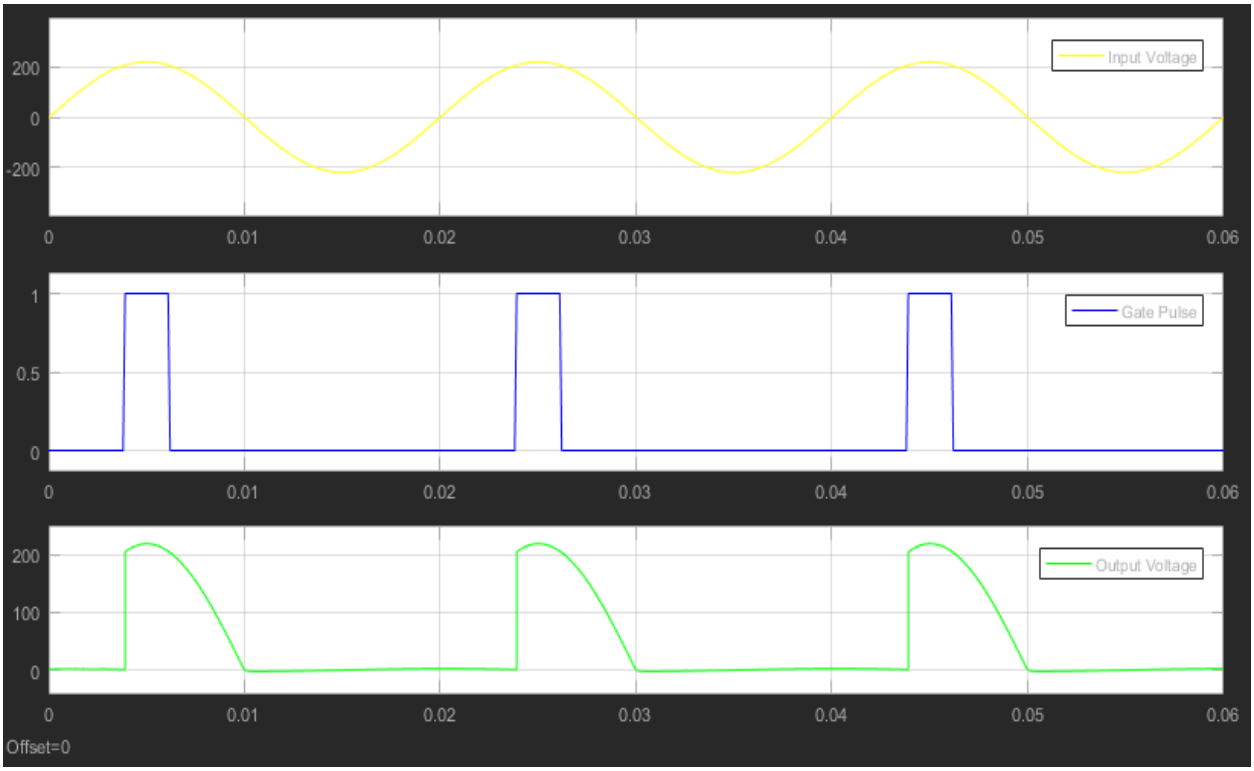

Figure 4.2.: Input Waveform, Gate Pulse of Thyristor (70degree) and Output Waveform of Half Wave Controlled Rectifier in Simulink Scope

Full-Wave Controlled Rectifier Circuit:

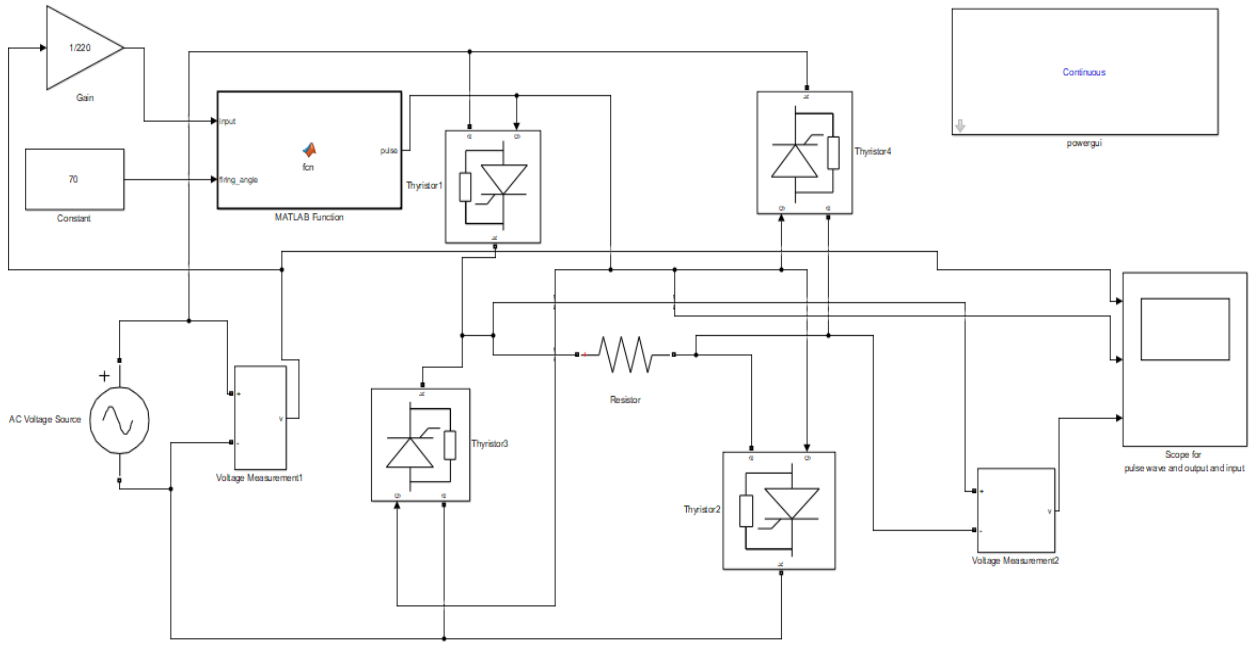

Figure 4.3.: Full-Wave Controlled Rectifier Circuit Using Simulink

Output Waveform:

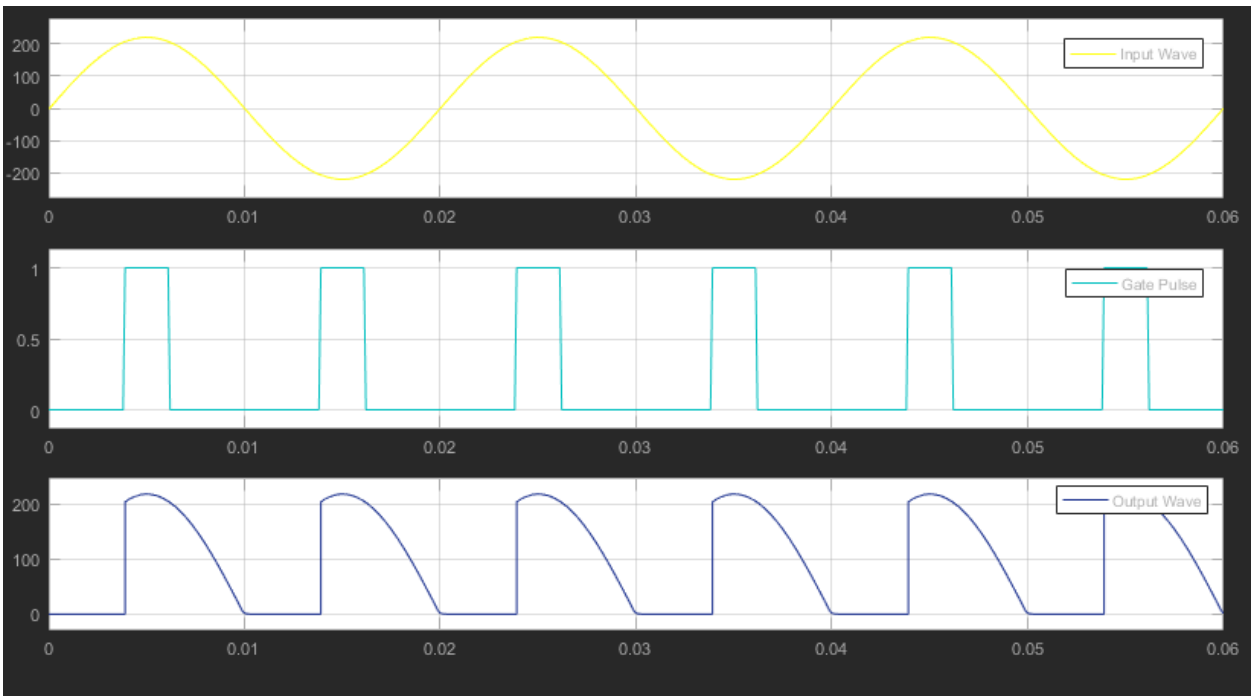

Figure 4.4.: Input Waveform, Gate Pulse of Thyristor (70degree) and Output Waveform of Full-Wave Controlled Rectifier in Simulink Scope

Discussion: The experiment was about controlled rectifier circuit in Simulink and the knowledge of gate pulse and advantage of thyristor was used to control the output. The experiment was to implement the power electronics circuitry in MATLAB Simulink. The gate pulse was generated from the source using programming logic which can be implemented in real world. This gate pulse was supplied in the gate of thyristor and thus the circuit became controlled. A constant was taken as a firing angle which controlled the output. Then the output from Simulink was compared with the theoretical output and it was same. So, the experiment was done carefully and the desired output was found from the experiment.